

**REMARKS/ARGUMENTS**

Reconsideration of this application is requested. Claims 1 to 15 and 23 to 41 are in the case.

**Claim Rejections – 35 USC Section 103(a)**

The Examiner has rejected claims 1 to 37 as being obvious in view of Japanese Publication No. 2-160473. The Examiner has additionally made of record U.S. Patent Nos. 4,337,900 (Williams at al), and 5,769,331(Yamagishi), and International Publication No. WO95/19454. In response, the applicant has canceled claims 16 to 22. The rejection of remaining claims 1 to 15 and 23 to 37 is respectfully traversed, and it is respectfully submitted that the present invention as defined in claims 1 to 15 and 23 to 41 is patentable over the teachings of this Japanese Publication, as well as over the teachings of the additional art cited but not relied upon. Before addressing this argument in detail, the invention and its relationship to the known art are summarized below.

**Amendments**

Claims 16 to 22 have been canceled and new claims 38 to 41 have been added to more clearly distinguish the present invention from the art cited. Support for new claims 38 to 41 can be found in paragraphs 22 and 26 of the specification.

Paragraph 9 of this specification has been canceled in view of the amendments to the claims, and paragraph 16 of this specification has been amended to correct a typographical error.

### **Background and Summary of the Invention**

The present invention relates in general to a method of recycling aluminum alloy wheels in a manner that allows them to be used to produce new aluminum alloy wheels.

Aluminum car wheels are typically made of high purity aluminum alloy – often from Aluminum Association alloy No. A356.2. In addition to this high purity aluminum alloy, car wheels may also comprise the following materials: paint, clear coat and rubber. If an alloy wheel made from alloy No. A356.2 is melted while contaminated with too much of any of these materials, than the composition of the melt will vary from the specification required of alloy A356.2 and will not be suitable for use in casting new alloy wheels made from alloy A356.2. As a result, aluminum alloy wheels are often recycled to produce less valuable products, such as, for example, Aluminum Association alloy No. A356.1, or an iron diluter for the production of various lower purity aluminum alloys.

### **Japanese Publication No. 2-160473**

The Examiner provided a translated abstract of this Japanese Publication. This abstract briefly describes a process for removing paint from aluminum alloy cans, in which the aluminum cans are cut into small pieces and then blasted with shot-spheres projected at high speed to strip off the paint by impact and frictional forces. According to the Derwent translation, this process effectively removes paint from used cans without generating combustion gases and thereby causing air pollution.

### **Japanese Publication No. 2-083167**

This additional Japanese Publication came to the attention of the applicant in considering the office action of February 2, 2005. Similar to Japanese Publication No.

2-160473, this reference describes cutting used aluminum cans up into pieces and then projecting metal grains at high speed onto these pieces to remove printed paint films. A copy of this Japanese Publication No. 2-083,167 is provided with the information disclosure statement filed herewith.

The Examiner takes the position that the present invention is obvious in view of Japanese Publication No. 2-160473. This position is respectfully traversed with respect to the claims in the application. Specifically, the applicant is unaware of, and the Examiner has not provided, any relevant, identifiable source of information that suggests that the shot blasting taught by Japanese Publication No. 2-160473 could be incorporated into a method of recycling aluminum alloy wheels. In fact, as outlined in the attached Declaration of Edward Pchola ("the Declaration"), this is not the case.

As outlined in paragraph 5, 6 and 12 of the Declaration, aluminum can material is substantially different from aluminum wheel material, in terms both of its composition and its dimensions. For this reason, these materials are recycled separately using different processes. On this basis, it is respectfully submitted that it would not, in general, be obvious to take a technique used in the recycling of aluminum cans and use this technique in the recycling of aluminum alloy wheels.

In this case, there are additional reasons why one of skill in the art, if aware of the use of shot-blasting in the recycling of aluminum cans, would not think to apply this technique to the recycling of aluminum alloy wheels. That is, as outlined in paragraphs 7, 9 and 12 of the Declaration there are significant problems with employing shot blasting even within the context of recycling aluminum cans. For example, there are purity-related problems arising both from insufficient cleaning of the pieces of the cans, and potential contamination of the recycled material by the shot material. Given these factors, it is respectfully submitted that one of skill in the art would not apply a technique in the aluminum can recycling art, which has purity-related problems and does not appear to be used to any significant extent, to the recycling of aluminum alloy wheels.

This submission is further strengthened by the fact that as outlined in paragraph 11 of the Declaration,

"[g]iven the demand for high purity aluminum alloys, any business that develops an economical method of recycling aluminum alloy wheels back into new aluminum alloy wheels will greatly benefit. Perhaps more telling in the terms of the question of obviousness, a number of these business have extensive experience with recycling of both aluminum alloy wheels and aluminum cans; however, I am not aware of any business that has applied shot blasting to the recycling of aluminum alloy wheels."

In view of the forgoing, it is respectfully submitted that the claims are allowable over the cited references. Allowance of the application is respectfully requested.

If any questions arise, it is requested that the undersigned be contacted at the number provided below.

Respectfully submitted,

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Appl. No.: 10/657,706  
Amdt. dated: May 10, 2005  
Reply to Office action of February 2, 2005



IN THE UNITED STATES PATENT AND TRADE MARK OFFICE

In re Patent Application of

HOUSE OF METALS

COMPANY LIMITED

Atty Ref. 13469-002

Serial No.: 10/657,706

Group:

Filed: September 9, 2003

Examiner: Mark Rosenbaum

For: METHOD FOR RECYCLING ALUMINUM ALLOY WHEELS

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Honorable Commissioner of Patents and  
Trademarks  
Washington, DC 20231

DECLARATION OF EDWARD PCHOLA

**DECLARATION Under 1.132**

Sir:

I, Edward Pchola, hereby say and declare:

1. I was Vice-President Operations with Alcan Recycling in Cleveland, Ohio from 1988 until my retirement in 1998. I was in charge of four recycling plants. Two of these, located in Greensboro, Georgia and Berea, Kentucky, were and still are totally dedicated to used aluminum beverage can (UBC) recycling. The other two plants were secondary smelters located in Shelbyville, Tennessee and Guelph, Ontario.

2. As set out in my curriculum vitae, a copy of which is attached as Exhibit "A" hereto, I have extensive experience in aluminum recycling, including the recycling of aluminum cans and automotive parts. I was Alcan's first plant manager at the Greensboro, Georgia plant for four-and-a-half years. After being transferred to Cleveland, Ohio as General Manager – Alcan Recycling, I built the

\$50 million (USD) plant in Berea Kentucky in 1987-1988. I was then promoted to Vice President – Operations.

### EXPERIENCE

3. The Greensboro and Berea UBC plants mentioned above in paragraph 1 are identical in that they are state-of-the-art aluminum can recycling operations, typical of large-scale aluminum can recycling operations anywhere in the world. That is, these recycling operations are closed-loop recycling plants. They take in purchased aluminum beverage cans composed of aluminum. The recycling process then employed includes shredding, screening, magnetic separation, air-knife separators, complex thermal decoating, (delaquering) equipment. The decoated shreds are hot-conveyed to melting furnaces, and then to tilting holding furnaces where the molten aluminum is conveyed by trough to a D.C. casting center, which casts the metal into large sheet ingots (40,000 lbs.) which are sent to Alcan's rolling-mill plants in other locations for hot rolling and cold rolling into coils of can sheet, which are then shipped to can customers to make new cans. The Greensboro and Berea plants recycle at least 200,000 metric tons per annum of aluminum beverage cans. The North American market recycles approximately 80 billion aluminum cans every year. Following the completion of the Berea plant, I built a \$35 million (USD) similar but smaller plant for Alcan at Latchford Locks in the United Kingdom. The UK plant was built to recycle aluminum cans from all over Europe.

4. The other two plants I was responsible for in my division were secondary recycling plants, also called secondary smelters. As mentioned above in paragraph 1, one was located in Shelbyville, Tennessee and the other in Guelph, Ontario. These two facilities recycled all types of aluminum scrap, but primarily automotive aluminum scrap such as machine turnings and borings, fragmented aluminum scrap from auto-shredders, cylinder heads, carburetors, auto trim, pumps, wheels, extrusion scrap, painted siding, foil, wire, lithographic scrap, cable, aircraft scrap, military scrap and reclaimed scrap ingot. No, or very,

very few beverage cans were recycled at these locations. The Shelbyville and Guelph plants produced a combined 120,000 metric tons per annum foundry ingot.

### RECYCLING GENERALLY

5. It is very important to understand that there is a basic difference in the chemical composition of can sheet alloys to that of secondary foundry alloys, which include wheel alloys. Wheel alloys are high in silicon content (6.5 to 7.5%), and are very low in magnesium content (less than 0.40%), and in manganese content (around 0.05% or lower). Can sheet alloys contain magnesium (around 1%) and low silicon (less than 0.40%). In aluminum can recycling plants, wheel alloy or other casting alloys are considered to be contaminants based on chemistry alone. Conversely, in secondary or wheel alloy plants, can scrap is not wanted due to conflicting chemical compositions.

6. Basically recycling aluminum scrap comes down to scrap values. The best value is when the scrap can be put back into the same product, or a higher value product. For example, as described above, used aluminum beverage cans can be recycled back into new aluminum cans. Thus, the value of aluminum scrap depends on its quality – cleanliness, alloy segregation and chemical composition. Contaminants such as plastic, paint, lacquer, paper, iron, stainless steel, rubber, wood, oil and water lower the value of the scrap. So does the mixing of many alloys, which may or may not be separated. As described above, UBC scrap is not used to make aluminum wheels, and aluminum wheel scrap is not used to make can sheet.

7. In my experience both domestically and internationally, shot blasting is not the process of choice to recycle used aluminum beverage cans due to a number of problems. Shot blasting can be very abrasive to the thin-walled aluminum can shreds (thickness of 0.01 inch), which would cause aluminum fines to be removed from the surfaces, which reduces the net amount of aluminum to be recovered. In the process of cutting up or shredding the

aluminum cans, many of the cut up pieces are going to be kinked and folded over, thereby covering up some of the surface area that needs to be abraded. Hence shot blasting the aluminum scrap will not complete the cleaning up process. In addition, the steel and zinc from the shot material can contaminate the recycled material. This, combined with the additional negative of generating unrecoverable aluminum fines, reduces the scrap value. Finally, heat resulting from the impact of the shot with the aluminum pieces may cause oxidation. Aluminum oxides are a significant problem in recycling and need to be avoided if possible, as they will be lost when the aluminum pieces are re-melted. Due to these problems, shot blasting is not typically used in aluminum can recycling. Instead, thermal means are used to remove the lacquer or coat from the sides of the aluminum pieces, even those pieces kinked and folded over.

JAPANESE PUBLICATION REFERENCE NOS. 2-160473 AND 2-083167

8. These English language abstracts briefly describe processes for removing paint from aluminum alloy cans. Both processes involve cutting the aluminum cans into small pieces and then blasting the pieces using shot or metal grains projected at high speed to strip off the paint by impact and frictional forces. According to these references, this process removes paint from used cans without generating combustion gases and thereby causing air pollution.

9. As described above, this method of recycling aluminum alloy cans suffers from a number of disadvantages. In terms of the purity of the resulting alloy, the material of which the shot is composed will likely contaminate the recycled aluminum. As the cut up pieces are likely to be kinked and folded over thereby covering up some of the surface area that needs to be cleaned, the shot blasting process is unlikely to completely clean the aluminum can shreds. In addition, the amount of aluminum that can be recycled can be reduced both as a result of aluminum fines being removed from the many surfaces and the heat resulting from the impact of the shot producing aluminum oxides.

## THE INVENTION

10. I have read and understood US Patent Application No. 10/657,706 (hereinafter "the Application"), which describes a method of recycling aluminum alloy wheels in such a way as to enable the secondary alloy produced by recycling to be used to produce aluminum alloy wheels. Specifically, the presence of contaminants such as paint, clear coat, and rubber, if included in the recycled aluminum in sufficient quantities will prevent the secondary alloy produced from being used to produce new aluminum alloy wheels. The Application describes how virtually all of the paint, clear coat and rubber, can be removed from aluminum alloy wheels by shot blasting.

11. As the demand for aluminum increases, large multinational companies are actively searching for ways of producing more useful secondary alloy from recyclable aluminum product. Many are actively involved in the recycling of aluminum alloy wheels; however, the resulting secondary alloy will typically be contaminated by other materials attached to the aluminum alloy wheel being recycled, and, consequently, cannot be used to replace primary metal in the manufacture of new aluminum alloy wheels. Given the demand for high purity aluminum alloys, any business that develops an economical method of recycling aluminum alloy wheels back into new aluminum alloy wheels will greatly benefit. Perhaps more telling in terms of the question of obviousness, a number of these businesses have extensive experience with recycling of both aluminum alloy wheels and aluminum cans; however, I am not aware of any business that has applied shot blasting to the recycling of aluminum alloy wheels.

12. Further, I do not think that businesses seeking to devise new ways of recycling aluminum alloy wheels would think to apply shot blasting, if used within the context of aluminum can recycling, to the recycling of aluminum alloy wheel material. This is for at least two reasons. First, the aluminum can material is, as described above, significantly different from aluminum alloy wheels, as the aluminum can material is, of course, much smaller and thinner walled. In addition, aluminum can material is rolled material having different alloying

elements (for example manganese) than aluminum alloys used for vehicular wheels, which are cast, not rolled, and contain alloying elements, such as silicon, that facilitate flow. Second, given that shot blasting will typically reduce the purity of aluminum can alloy, it would not be obvious to apply shot blasting to the recycling of aluminum alloy wheels, where purity is of great concern.

13. I understand that the patent office has some question regarding whether the application of shot blasting to the recycling of aluminum alloy wheels is obvious; in my opinion, the invention disclosed in the Application is not obvious.

14. I hereby declare that all statements made herein of my/own knowledge are true, and that all statements on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001, and may jeopardize the validity of the application or any patent issuing thereon.

Edward A. Pchola 3 May 2005  
Edward A. Pchola